issue of this Review. The usual table of flood stages and dates for July follows:

[All dates in July unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE					
	Feet			*Feet*	
Canadian: Logan, N. Mex.	4	14	16	6.0	14
		23	25	7.0	23
WEST GULF DRAINAGE					
Trinity: Dallas, Tex.	25	27	(1)	[2] 27.2	31
Rio Grande: San Marcial, N. Mex.	3	15	15	3.4	15
		23	25	3.9	23
PACIFIC DRAINAGE					
Colorado: Parker, Ariz.	7	(3)	(1)	10.5	June 7, 17–20

[1] Continued at end of month.
[2] Artificial stage, caused by construction of temporary dam necessary for levee work below gage.
[3] Continued from last month.

The following discussion of effects of the heavy and concentrated summer-time rains of the Rocky Mountain region is submitted by Mr. J. Cecil Alter of the Weather Bureau office at Salt Lake City, Utah:

A series of sudden, rapid, local showers during the evening of July 10th sent short-lived mud streams dashing out of a number of steep gullies and ravines on the face of the Wasatch Mountains between Centerville and Farmington, Utah, also from side gullies in Spanish Fork Canyon, Parleys Canyon near Salt Lake City, and in Weber Canyon (near Ogden) in the vicinity of Devils Gate, causing altogether a property loss and repair expense approaching $100,000 in a comparatively few minutes.

Several mud washes crossed the highway in Parleys Canyon, stalling automobiles for a few hours, and similar damage was done in Spanish Fork Canyon, southeast of Spanish Fork town. One short slide spent itself on the higher land above Centerville; but three other washes toward Farmington left masses of soil, sand, gravel, rocks, and bowlders more than a mile in length, largely through farming sections, ranging from a few yards to nearly a thousand feet in width and from one to twelve feet in depth, resulting in property damage of about $50,000. The paved highway was cleared only after a week's work with men, teams, and steam shovels, the three cuts being from 300 to 500 feet in length and from 1 to 10 feet deep.

Toward the terminals of these earth washes fairly clean sand and soil buried this season's crops and damaged the land more or less, but farther up a considerable acreage of farming land was ruined for agricultural or residence purposes by heavy deposits of soil, rocks, and bowlders, some of them from four to six feet through, besides destroying the growing crops, bearing orchards, fences, irrigation waterways, barns, siloes, coops, and other structures, including two or three brick cottages which were so badly flooded, damaged, or buried as to necessitate abandonment along with the land. A small loss of poultry, pigs, and sheep occurred, along with some farming implements and vehicles. Three automobiles on the State highway were caught in one flood at South Farmington and were buried to the radiator tops, though the passengers escaped safely.

A large quantity of earth was deposited across the highway and railroad track just within the mouth of Weber Canyon, but the largest slide of the series occurred near Devils Gate, where an immense mass of débris from an adjacent gully piled into the canyon 35 feet high and 400 feet wide, extending nearly across the canyon. The Weber River, one of the State's largest, was completely dammed and the entire stream diverted onto the railroad and highway a distance of several hundred feet. It required the continuous effort of steam shovels, drag lines, teams, and laborers more than a week to turn the stream back into its natural channel and clear and repair the roadways.

Near by two loaded trucks on the highway and one passenger automobile were half buried, but later excavated safely. Just after the river broke over the artificial dam the stream was turbulent for a few hours, washing the railroad grade pretty badly in one place, leaving the rails hanging in space; and many fish were drowned in the roily waters. The supply flume for the Davis and Weber Counties canal system was broken by the mud slide, and the intake ditches farther down were silted full; but the rain on the crops was about equal to the watering missed while cleaning and repairing the damaged lines. Other minor damages were reported farther north, in Cache Valley.

These mud slides were not landslides, but mere washes, resulting from the sudden, rapid, and rather heavy downpours of rain, on very dry, steep, scantily covered slopes, which had not been washed recently. The three larger mud runs near Farmington were on the crests of broad, well developed talus cones which have doubtless resulted from similar washes at intervals through the ages past. However, other near-by gullys, ravines, and canyons some of which have only in recent years disgorged similar or worse masses of earth, failed to do so in this storm, indicating the apparently limited extent of the areas of heaviest rainfall.

The storm was rather general in northern Utah, though precipitation amounts were mostly only moderate, ranging from 0.35 to 0.85 inch at the measuring stations Losses aggregating $44,000 have been estimated in the Centerville-Farmington district; and the cost of clearing the highways and railroads and making repairs is considered to have exceeded $50,000.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, JULY, 1930

By J. B. KINCER

General summary.—The outstanding feature of the month's weather was the development of severely droughty conditions over central parts of the country, attended by extremely high temperatures.

During the first decade generally good harvest weather prevailed in the main Winter Wheat Belt, with much sunshine and only local showers, but in the more Northwestern States high temperatures and dry weather were unfavorable. In the South local showers were beneficial, but a good, general rain was needed over this area, while droughty conditions continued in the east-central sections, principally in Kentucky, West Virginia, and adjacent States. Most crops needed a generous rain throughout central areas of the country.

During the second and last decades there was no relief from the drought, with high temperatures serving to intensify conditions in most places. Local showers afforded some relief, but crops, in general, suffered severely from extreme heat and the absence of rain. During the month temperatures of 100°, or higher, were reported from first-order Weather Bureau stations on 4 to 6 days in the Middle Atlantic sections and from 6 to as many as 15 days in nearly all sections from the northern portions of Alabama, Mississippi, Louisiana, and northeastern Texas northward over the Ohio and Mississippi Valleys and Plains States to eastern South Dakota. The latter part of the month lower temperatures overspread much of the country, but were beneficial only in checking the rapid deterioration of growing crops, while at the close generous rains were needed badly to replenish water supplies and aid crops that were not too far gone.

Small grains.—Harvesting and threshing winter wheat progressed throughout the month, with practically no interruption by rain. The extreme heat was very unfavorable for men and horses, however, with reports of many horses dying in some central and upper Mississippi Valley areas. The weather during the latter part of the winter wheat season was practically ideal for gathering the grain in excellent condition. Some damage to spring wheat occurred through deficient moisture and hot winds, but at the close of the month harvesting the early crop was well advanced. Oat harvest progressed favorably, with threshing returns varying widely; at some places results were better than anticipated. Flax showed some injury from dryness, particularly the late crop, while some abandonment of rice fields was necessary in Arkansas, although showers were helpful elsewhere. At the close of the month plowing and disking for winter wheat was making excellent advance in Kansas.

Corn.—The weather during the month was especially unfavorable for the corn crop, with general drought

prevailing, aggravated by the extremely high temperatures. At the beginning of the month conditions were already serious in the eastern Corn Belt, especially in southern Indiana and Illinois, Ohio, and most of Kentucky; in this area upland corn was fired, while lowland needed rain badly. The continued absence of rain caused most upland corn to deteriorate badly throughout the belt, and at the close of the month much was burned beyond recovery, especially in the Southwest and the Ohio Valley. By the close of the month the continued drought had caused widespread injury to corn, with the larger part of the crop in Missouri ruined and much unfit even for silage. In southwestern Iowa the crop deteriorated badly, with many tassels and leaves burned white, while in the immediate Ohio River region much corn was beyond recovery. In the northern parts of Indiana and Illinois conditions were not so serious and were still fair in Nebraska and parts of Kansas, although rain was urgently needed.

Cotton.—Although conditions were fairly favorable at the beginning of the month in the western states of the Cotton Belt, the drought became progressively worse and at its close most of this section was unfavorably dry. In Texas progress of cotton in the southern third was mostly good throughout the month, except for some shedding, but in the northern two-thirds of the State deterioration had set in at the close, with complaints of small plants bolls shedding, and premature opening. Cotton made very little growth in Oklahoma also, with wilting and some shedding reported, while the general condition of the crop was only poor to fairly good at the close of the month. In central States of the belt most upland cotton made but little growth, except where local showers occurred and on some lowlands. In the Atlantic States conditions were much better, although rain was beginning to be needed in places at the close of the month. The first bale was marketed from Georgia toward the close, while marketing had advanced northward to Rusk County in Texas.

Miscellaneous.—At the close of the month pastures and meadows were badly burned and brown practically everywhere east of the Rocky Mountains and were affording little, if any, feed; water was scanty everywhere in this area. In the southwestern range country conditions were good, with the range, stock, and water supply largely excellent.

Minor crops deteriorated badly due to the dry weather, except for local areas where showers occurred. Tobacco was also seriously harmed in the dry regions, with forced cutting under way in northern Kentucky at the close of the month. Fruits shriveled under the intense heat, but most crops were apparently holding up fairly well.

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

NORTH ATLANTIC OCEAN

By F. A. YOUNG

While the absence of heavy weather was not so marked as during the preceding month, the number of days with gales was below the normal over the greater part of the ocean and the number of gale reports received less than usual. The outstanding feature of the month was the unusual strength of the east and northeast trades in the southwestern section of the Caribbean Sea during the first and last decades of the month. Due to the lack of important cyclonic disturbances, the usual charts have been omitted.

Fog was unsually prevalent north of the 40th parallel and the number of days on which it occurred in different localities was as follows: Over the Grand Banks, from 13 to 15 days; along the American coast between the 40th and 45th parallels, from 5 to 23 days; over the steamer lanes between the 20th and 45th meridians, from 10 to 15 days; along the European coast, from 2 to 6 days.

Barometric data for several island and coast stations are given in the following table:

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, 8 a. m. (seventy-fifth meridian)—North Atlantic Ocean, July, 1930*

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Belle Isle, Newfoundland	29.83	[1]—0.04	30.10	11th	29.50	22d.
Halifax, Nova Scotia	29.88	[2]—0.07	30.08	5th [3]	29.48	20th.
Nantucket	29.90	[2]—0.08	30.16	16th	29.66	20th.
Hatteras	29.98	[2]—0.06	30.20	5th	29.78	10th.[3]
Key West	30.04	[2] 0.00	30.14	23d [3]	29.94	14th.
New Orleans	30.06	[2]+0.03	30.16	23d [3]	29.90	13th.
Cape Gracias, Nicaragua	29.91	[1] 0.00	29.96	20th [3]	29.84	2d.[3]
Turks Island	30.11	[1]+0.04	30.18	22d [3]	30.02	6th.
Bermuda	30.15	[2]—0.03	30.30	16th	29.98	28th.
Horta, Azores	30.21	[1]—0.06	30.50	7th	29.76	19th.
Lerwick, Shetland Islands	29.77	[1]—0.03	30.03	9th	29.37	18th.
Valencia, Ireland	29.91	[1]—0.07	30.41	10th	29.32	17th.
London	29.86	[1]—0.12	30.24	7th	29.39	18th.

[1] From normals shown on Hydrographic Office Pilot Charts, based on observations at Greenwich mean noon, or 7 a. m., seventy-fifth meridian time.
[2] From normals based on 8 a. m. observations.
[3] And on other dates.

Reports were received indicating that unusually strong easterly and northeasterly trade winds prevailed in the Caribbean Sea on the 1st, 4th, and 6th, occurring on the 4th in the region of the Canal Zone.

Favorable weather was the rule over the greater portion of the ocean during the first decade of the month, except that on the 6th moderate gales prevailed over a limited area in the vicinity of Hatteras and also over the eastern section of the northern steamer lanes, while on the 9th a gale was reported by a vessel about 250 miles east of Belle Isle.

From the 11th to 14th a disturbance was over the 40th parallel between the 55th meridian and American coast that apparently moved but little during that period.

From the 15th to 17th a well developed LOW was over Ireland, and while, according to ship reports, moderate winds prevailed, on the 17th the station at Blacksod, Ireland, reported a northerly wind, force 7. This LOW drifted slowly eastward and from the 21st to 25th remained nearly stationary over the North Sea, accompanied by favorable weather.

From the 18th to 20th moderate gales prevailed over the steamer lanes east of the 25th meridian, while from the 21st to 24th light to moderate winds were the rule over the ocean as a whole.

On the 25th a LOW was central near 53° N., 20° W., that moved slowly eastward, increasing in intensity, and on the 26th moderate to strong gales were reported by vessels between the 20th meridian and the coast of Ireland. This disturbance then decreased in force and extent, although from the 27th to 29th westerly gales prevailed in the southerly quadrants.

On the 31st a well-developed depression was central near 47° N., 25° W., accompanied by winds of force 7 and 8 at time of observation, that increased to force 10 later in the day.

On the 20th, 23d, 29th, and 30th the northeast and easterly trade winds were again unusually strong in the southwestern Caribbean Sea, extending on the 29th to the Canal Zone.

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